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Poster session 1

On the effect of nontemporal stimulus magnitude on perceived duration as assessed by the method of temporal reproduction

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Several studies suggest that perceived duration of visually presented stimuli increases with increasing stimulus size. To elucidate the nature of this effect, two experiments were performed using the method of temporal reproduction. In time psychophysics, performance on time perception is often explained by the assumption of a hypothetical internal-clock mechanism based on neural counting. According to this account, a neural pacemaker generates pulses, and the number of pulses relating to a physical time interval is recorded by an accumulator. Thus, the number of pulses counted during a given time interval is the internal representation of this interval. Based on these considerations, the effect of nontemporal stimulus magnitude on perceived duration should be brought about by a positive functional relationship between nontemporal stimulus magnitude and pacemaker speed. By employing a temporal reproduction task, the question of whether nontemporal stimulus magnitude affects pacemaker speed was investigated based on the following rationale: (1) If larger nontemporal stimulus magnitude speeds up the pacemaker rate, increasing the size of the stimulus marking the target interval should result in longer reproduced (perceived) duration. (2) If this assumption holds, increasing the size of the stimulus indicating the reproduction interval should result in shorter reproduced (perceived) duration due to increased pacemaker speed during temporal processing of the reproduction interval.

In order to investigate whether the effect of nontemporal stimulus magnitude on perceived duration can be explained by a direct effect on pacemaker speed, two experiments were conducted employing a temporal reproduction task. In Experiment 1, the effect of nontemporal stimulus magnitude on perceived duration was assessed by experimentally varying the physical size of the stimulus that marked target intervals ranging from 800 to 1200 ms, whereas, in Experiment 2, physical size of the stimulus marking the reproduction interval was varied. In Experiment 1, a statistically significant main effect of stimulus size on reproduced duration supported the notion that large target stimuli were perceived temporally longer than small target stimuli. However, there was no indication for a main effect of stimulus magnitude on perceived duration in Experiment 2 where physical size of the visual stimulus was systematically varied during the reproduction interval.

The present findings clearly argue against the general notion that the effect of nontemporal stimulus magnitude on perceived duration originates from a direct effect of stimulus size on pacemaker speed. An alternative interpretation implicates nontemporal cognitive processes to account for the effect of stimulus magnitude on perceived duration. When performing temporal reproductions, participants have to attend to the interval to be reproduced, maintain the temporal information, categorize it, make a decision, and, eventually, perform a response. Although not directly involved in the genuine timing process, all these operations are required for successful temporal reproduction. Thus, the effect of nontemporal stimulus magnitude on perceived duration may be mediated by one or several of these processes.

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